The DC is impressed with the coding/labeling systems, Atherton adds. "The flexibility they give us is terrific," he says. "We're applying the labels, making pretty hard contact with plastic totes, so it's a tough application for labeling machines. But the PA/5000 units have withstood the test of time without any major maintenance problems. We plan to add at least one more machine that will service three additional pick lines."

Considered one of the country's leading drugstore chains, Rite Aid Corp., Camp Hill, PA, combines its store base, brand name, eight distribution centers and pharmacy technology with a team of a whopping 72,000 full- and part-time associates and 3,400 stores that serve customers in 28 states and the District of Columbia. The stores posted 2003 sales of $15.8 billion.

With that much volume and sales, the company opened its eighth distribution center in 2000, a state-of-the-art, 875,000-sq-ft facility located in Lancaster, CA. Approximately 60 miles northeast of Los Angeles, the massive Lancaster DC fills about 12,000 to 25,000 bulk plastic totes each day with a wide assortment of "front-end" products before shipping them to 65 to 75 of the 400-plus stores within its distribution base. These items range

Coding Shipping-Tote the Rite Way | Rite Aid uses print/apply labelers to generate barcoded shipping labels for totes

from nonprescription health and beauty aids and cosmetics to small appliances. The outbound hand-held totes are clearly identified by a 20-digit, bar-coded shipping label affixed to their lids.

An extensive use of pick-to-light technology guides most of the DC's split-case items in the order-picking operation. This operation is equipped with about eight miles of conveyor leading to multiple pick modules, carousels, "fast-mover" lines and required reliable, durable bar-code labeling equipment that could upgrade Rite Aid's product identification, tracking, shipment addressing and bar-coding processes. To accommodate its bar coding/labeling function, Rite Aid installed a dozen PA/5000 label printer/applicators from Diagraph.

This next-label-out variable-information printer/applicator system generates assorted fonts, graphics and bar codes, printed and applied from pressure-sensitive label rollstock at resolutions of 203 or 300 dpi and works with label sizes up to 7.2 x 13 in. Rite Aid's bar-coded labels measure 3 x 4 in. Consistently applying the p-s labels with accuracy and precision, each of the PA/5000s at Rite Aid's facility are integrated with SATO print engines that feature a tamp label applicator pad (the system is also available with a choice of wipe-on, blow-on, pallet-tamp, dual-panel wraparound or dual-panel/dual-label applicators). The Rite Aid machines have an output capacity of about 15 totes/min but are designed to reach speeds of up to 30 totes/min.

Outfitted with built-in diagnostics and a menu-driven interface, the PA/5000 is easy to operate, Rite Aid says, with a menu that indicates all of the machine parameters. The PA/5000's discrete input/outputs (I/O) were impressive to Rite Aid's Bill Atherton, senior engineer, supply chain, who spearheaded the equipment installations.

"We needed a print-and-apply system that could deliver high-performance labeling in a demanding industrial environment," he says. "The I/O capabilities of the Diagraph label printer/applicators were a big benefit, because they eliminated our having to get another type of controller just for the labeler. We wanted the machine to be able to take care of all error inputs and outputs. There were few label printer/applicators [on the market] that offered this kind of capability when we purchased these systems. They were clearly superior."

Atherton says that when all of the mezzanines are taken into account, there is probably more than a million sq ft of space at the Lancaster facility. "This is our newest facility, and it's equipped with all new machinery," he says. "We also installed miles of conveyor from Siemens Dematic to handle our high volumes at the stores out here."

That the PA/5000 had to be reliable was an understatement, emphasizes Jack McMahon, regional market director for Diagraph. "Given the throughput of their operation, it was critical that Rite Aid have a machine that could run up to seven days a week, twenty-four hours a day," he says. "Reliability was at the top of the page, along with the ability of the machine to provide enough inputs and outputs—things we customized for Rite Aid and subsequently built into our unit as standard features."

The DC is laid out in zones similar to the zones in the company's stores, which makes restocking the stores more efficient, PD is told. The DC's sophisticated warehouse-management system (WMS) includes pick modules for the many stockkeeping units. The picking operation includes "case-pick" modules from which full caseloads of products are picked, as well as "each-pick" modules or items picked from split cases for about 70 percent of the items shipped. Each module has two or three levels and, according to Atherton, is a large racking system, with access from two sides–the back for replenishment and the front for order picking.

On the order-picking side, interactive pick-to-light systems use lighted numbers under each item on a flow rack to indicate which items and how many should be picked from each product bay for each pick list. The picking operator removes the indicated number of items and pushes a button to confirm the items were picked. The process is integrated with the label applicators by a personal computer. Atherton says having label printer/applicators on the picking lines allows the order pickers to focus solely on filling the orders without having to carry and affix labels.

Catch A Wave

There are approximately two pick-to-light lines for every label printer/applicator, Atherton says, which is another reason the company needed highly dependable coding/labeling equipment.

"The printer/applicators' dependability was absolutely critical," he says. "It impacts our picking efficiencies because if, for some reason, a line goes down even for just an hour, our picking efficiency in that area can drop by up to twenty-five percent, because the totes would back up on the conveyor line, stuck in the pick module. The machines have been very reliable, and it's critical for us to have as much uptime on these machines as possible."

The stores order once a week, which amounts to 40 to 70 truck runs a day. When a store requests an order, the orders are put into picking "waves," which designate a set of Rite Aid retail stores. The DC sets up about six waves per day. When a wave's pick list is released to the order-picking operation, the pick lists are transmitted to a set of pick PCs located in the warehouse.

To initiate the picking process, an operator scans their identification badge using a Symbol hand-held scanner at a specific picking zone at the pick-to-light system, logs on and scans a permanently affixed, 10-digit identification code/license plate on an empty tote. This license plate information is then relayed into the PC, which marries the order pick list to that particular tote. The operator then puts the tote on a dead-roller conveyor and starts loading the desired number of items from the perspective rack, which is illuminated below by pick-to-light numbers on a digital display.

The picking system is complex, notes Atherton, with the barrage of multilevel mezzanines with conveyors running their length, carousels for split-case picking on a second-level mezzanine, light-directed put stations, a set of pick modules, eight cross docks, a bulk storage area, two pick tunnels and much more.

"There are ten pick lines arranged in four each-pick-from-caseflow rack modules," Atherton explains. "Two of the modules are two actual floor levels-high and the other two modules are three-high. Across from them are two more modules that are each-pick-from-pallet-flow lines, which means orders here are split-case-picked directly from pallets. Each of those modules is three levels-high."

Picking, Loading, Coding

The facility uses two-way, rugged FP181 high-density polyethylene shipping totes from Menasha's Orbis Corp., that have two-piece interlocking lids. Measuring 21 x 14 in., the totes stand 12 in. tall and have slightly drafted bases.

The operator starts to pick a number of the packaged items from each "lighted" bay, loads the staged tote and then pushes a green light button to confirm that the items have been picked and loaded into the tote. Giving these the green light simultaneously updates the information on the PC.

When the tote order is complete, the operator places the filled tote onto a powered center section of the conveyor to exit the module. Or, if the system beeps twice, indicating the order isn't complete, the tote is passed to the next picker in line, in which case, a pick PC holds the information about what's already been picked and loaded in the tote and transfers the remaining picking data to the next pick station.

After an "exit tote" signal is sent to the picker, the completed, filled tote heads by takeaway conveyor to one of 12 Diagraph PA/5000 print-and-apply labeling systems. The "pick" PC also sends a message to the PC linked to the label printer/applicator. Stored in a local database that is called up when the totes arrive, the message indicates specific data that the PA/5000 will print in the form of a 20-digit bar-coded shipping label.

The shipping label contains a wealth of variable information, such as the 10-digit tote license plate ID code, which is also printed in human-readable characters beneath the code itself, plus a five-digit store code, the picking date, the wave number, the label applicator ID, a pick-list number and an operator log-on ID for all pickers who were involved with picking for the tote.

As totes approach the label printer/applicator, they pass a case stop and a singulation device that release just one tote at a time to pass through a pair of Accu-Sort Model 20 Series scanners mounted on either side of the conveyor belt. The scanners "read" the license plate ID for each tote and transmit the code to the label applicator control PC. The print information based on that data is then transmitted to the PA/5000, which automatically prints a 433-in. label from rollstock before the printed label transfers to an applicator pad. Emco furnishes the rolls of labels in quantities of about 1,200 labels/roll.

Checking And Rechecking

As the tote breaks the beam of a trigger photoeye located at the printer/applicator, the system applies a label the top of the tote. And, as a precaution, every label's 20-digit shipping bar code is then scanned by a second Accu-Sort system to verify that the correct information has been printed and the tote exits the labeling area. Atherton explains, "If there's a software error caused by a bad scan, for example, the conveyor and labeler will automatically stop because the scanners are linked to the label applicator PC.

"The Diagraph labelers have a lot of internal error-checking functions, which is the main reason we selected them. If, for example, the print engine is turned off, or if labels aren't feeding properly, the PA/5000 will detect an error and, by means of an output on the machine, send a message that stops the conveyor. The Diagraph labelers actually combine our software error signals with their own internal hardware error signals and will halt the conveyor for either type of problem."

Since the plastic totes are reusable, the labels must stay in place during the typical 48-hour turnaround time, yet must be easy for pickers to remove when starting a new pick order. The system is programmed for a long tamp dwell of about 40 milliseconds, he says, to assure good label adhesion. Because the labels experience basically a two-day lifespan, Rite Aid runs the labelers in direct thermal mode, which eliminates the need for printing ribbon. "It's just one less thing to worry about," says Atherton.

Says McMahon, "Dealing with different applicating substrates, the label printer/applicators can experience a lot of wear and tear on certain components. This system has an auto retract sensor that provides the ability to print and apply labels to a variety of different product heights without having to make [manual] adjustments. The sensor compensates for the taller products, reducing the wear and tear."

After the labels are applied and verified, the totes convey into a Siemens Dematic RS 200 sortation system that runs 540 ft/min, sorting totes by store number, based on the code in the label applied.

The sorter disseminates the totes based on store number and the other information contained on the coded label, and the totes are then scanned overhead by an Accu-Sort Model 3600 camera-based scanner. They next head to a manual palletizing station.

Coding On Target

The DC is impressed with the coding/labeling systems, Atherton adds. "The flexibility they give us is terrific," he says. "We're applying the labels, making pretty hard contact with plastic totes, so it's a tough application for labeling machines. But the PA/5000 units have withstood the test of time without any major maintenance problems. We plan to add at least one more machine that will service three additional pick lines."